

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) Magnetic particles capable of binding a target substance, which comprise a magnetic material and a matrix material, wherein the magnetic material is remanent upon exposure to a magnetic field such that the particles form aggregates when suspended in a liquid phase in the absence of a magnetic field, and the matrix material has a surface comprising functional groups which promote disaggregation of the particles in the presence of a liquid phase.

2. (Original) Magnetic particles according to claim 1, wherein the magnetic material comprises a magnetic metal oxide.

3. (Original) Magnetic particles according to claim 2, wherein the magnetic metal oxide comprises an iron oxide in which, optionally, all or a part of the ferrous iron thereof is substituted by a divalent transition metal selected from cadmium, chromium, cobalt, copper, magnesium, manganese, nickel, vanadium, and/or zinc.

4. (Previously Presented) Magnetic particles according to claim 1, wherein the magnetic material comprises a ferrimagnetic material.

5. (Original) Magnetic particles according to claim 4, wherein the ferrimagnetic metal oxide comprises ferrimagnetic magnetite.

6. (Previously Presented) Magnetic particles according to claim 1, wherein the magnetic material comprises a ferromagnetic material.

7. (Previously Presented) Magnetic particles according to claim 1, the length or diameter of which is in the range 0.1 to 5000 μ m.

8. (Previously Presented) Magnetic particles according to claim 1, which are substantially spherical.

9. (Previously Presented) Magnetic particles according to claim 1, wherein the matrix material comprises a polymer.

10. (Original) Magnetic particles according to claim 9, wherein the polymer comprises an organic polymer or a silica-based polymer.

11. (Previously Presented) Magnetic particles according to claim 1, wherein the functional groups of the matrix material are hydrophilic for use with an aqueous liquid phase.

12. (Previously Presented) Magnetic particles according to claim 1, wherein the functional groups of the matrix material are hydrophobic for use with a non-polar liquid phase.

13. (Previously Presented) Magnetic particles according to claim 1, wherein the matrix material further comprises an affinant for binding the target substance.

14. (Previously Presented) Magnetic particles according to claim 1, wherein the target substance is a nucleic acid.

15. (Original) Magnetic particles according to claim 13, wherein the affinant is capable of binding a cell, a protein, a virus or a prion.

16. (Original) Magnetic particles according to claim 15, wherein the affinant comprises an antibody, a binding protein, a fragment of an antibody or binding protein, or a ligand.

17. (Original) Magnetic particles according to claim 16, wherein the affinant comprises a binding protein which comprises an avidin for binding to a target substance which, is biotinylated, or the affinant comprises biotin and the target substance is avidinylated.

18. (Original) Magnetic particles according to claim 16, wherein the affinant comprises a ligand which comprises an oligonucleotide or a metal chelate specific for the target substance.

19. (Previously Presented) Magnetic particles according to claim 15, wherein the cell or protein is microbial.

20. (Original) Magnetic particles according to claim 13, wherein the target substance comprises a metal and the affinant comprises a chelator for the metal.

21. (Original) Magnetic particles according to claim 12, wherein the hydrophobic functional groups are capable of binding microorganisms or hydrophobic target substances.

22. (Currently Amended) A process for the preparation of magnetic particles capable of binding a target substance, which comprises providing an unmagnetised magnetic material, and providing a matrix material so as to form magnetic particles, wherein the magnetic material is remanent upon exposure to a magnetic field such that the particles form aggregates when suspended in a liquid phase in the absence of a magnetic field, and the matrix material has a surface comprising functional groups which promote disaggregation of the particles in the presence of a liquid phase.

23. (Original) A process according to claim 22, wherein the matrix material comprises a polymer.

24. (Original) A process according to claim 23, wherein the polymer comprises an organic polymer or a silica-based polymer.

25. (Previously Presented) A process according to claim 22, wherein the matrix material is provided preformed and added to the magnetic material.

26. (Original) A process according to claim 24, wherein the polymer is provided by polymerisation of a monomer in the presence of the unmagnetised magnetic material to form the magnetic particles comprising the magnetic material and a polymeric material.

27. (Original) A process according to claim 26, wherein the monomer comprises an organic monomer or a silica-based monomer.

28. (Previously Presented) A process according to claim 27, wherein the step of polymerisation comprises a step-growth condensation and/or a radical reaction.

29. (Previously Presented) A process according to claim 26, wherein the step of polymerisation takes place in an emulsion and the unmagnetised magnetic material is present in a discontinuous phase of the emulsion.

30. (Original) A process according to claim 29, wherein the step of polymerisation takes place in the discontinuous phase of the emulsion.

31. (Previously Presented) A process according to claim 29, wherein the monomer is present in a continuous phase of the emulsion, prior to polymerisation.

32. (Original) A process according to claim 31, wherein the monomer comprises an organic monomer and the emulsion is a water-in-oil emulsion.

33. (Original) A process according to claim 31, wherein the monomer comprises a silica-based monomer and the emulsion is an oil-in-water emulsion.

34. (Previously Presented) A process according to claim 26, wherein the step of polymerisation takes place in a solution.

35. (Previously Presented) A process according to claim 22, wherein the magnetic material comprises particles, the length or diameter of which is in the range 100 to 300nm.

36. (Previously Presented) A process according to claim 22, wherein the magnetic particles are capable of binding a target substance, which comprise a magnetic material and a matrix material, wherein the magnetic material is remanent upon exposure to a magnetic field and the matrix material has a surface comprising functional groups which promote disaggregation of the particles in the presence of a liquid phase.

37. (Previously Presented) Use of magnetic particles according to claim 1, for separating a target substance from a sample containing such a target substance.

38. (Previously Presented) Use of magnetic particles according to claim 1, for separating a target substance comprising a cell, a microorganism, or a protein from a sample containing such a target substance.

39. (Previously Presented) Use of magnetic particles according to claim 1, for separating a target substance comprising a metal from a sample containing such a target substance.

40. (Previously Presented) Use of magnetic particles according to claim 1, for separating a target substance comprising an organic compound from a sample containing such a target substance.

41. (Previously Presented) Use of magnetic particles according to claim 1, for separating a target substance comprising a nucleic acid from a sample containing such a target substance.

42. (Previously Presented) Use according to claim 37, wherein the target substance is isolated from the sample.

43. (Previously Presented) Use according to claim 37, wherein the target substance is depleted from the sample.

44. (Previously Presented) Use of magnetic particles according to claim 1, in a cell sorting apparatus.

45. (Currently Amended) A process for separating a target substance from a target substance containing sample, which comprises:

(a) providing target substance binding magnetic particles which comprise a magnetic material and a matrix material, wherein the magnetic material is remnant upon exposure to a magnetic field such that the particles form aggregates when suspended in a liquid phase in the absence of a magnetic field;

(b) providing a liquid phase comprising the target substance-containing sample;

(c) dispersing the sample with the magnetic particles so as to bind the target substance thereto by subjecting the magnetic particles to disruption to disaggregate the particles;
and

(d) isolating the particles from the sample by applying a magnetic field thereto and separating the particles from the liquid phase.

46. (Canceled)

47. (Original) A process according to claim 46, wherein the disruption comprises mechanical disruption selected from pipetting, stirring, vortexing and/or shaking, sonication or UV disruption.

48. (Previously Presented) A process according to claim 45, wherein the magnetic particles are capable of binding a target substance, which comprise a magnetic material and a matrix material, wherein the magnetic material is remanent upon exposure to a magnetic field and the matrix material has a surface comprising functional groups which promote disaggregation of the particles in the presence of a liquid phase.

49. (Previously Presented) A process according to claim 45, wherein the magnetic particles are capable of binding a target substance, which comprise a magnetic material and a matrix material, wherein the magnetic material is remanent upon exposure to a magnetic field and the matrix material has a surface comprising functional groups which promote disaggregation of the particles in the presence of a liquid phase, and the target substance comprises a cell, a microorganism, or a protein.

50. (Previously Presented) A process according to claim 45, wherein the magnetic particles are capable of binding a target substance, which comprise a magnetic material and a matrix material, wherein the magnetic material is remanent upon exposure to a magnetic field and the matrix material has a surface comprising functional groups which promote disaggregation of the particles in the presence of a liquid phase, and the target substance comprises a metal.

51. (Previously Presented) A process according to claim 45, wherein the magnetic particles are capable of binding a target substance, which comprise a magnetic material and a matrix material, wherein the magnetic material is remanent upon exposure to a magnetic field and the matrix material has a surface comprising functional groups which promote disaggregation of the particles in the presence of a liquid phase, and the target substance comprises an organic compound.

52. (Previously Presented) A process according to claim 45, wherein the magnetic particles are capable of binding a target substance, which comprise a magnetic material and a matrix material, wherein the magnetic material is remanent upon exposure to a magnetic field and the matrix material has a surface comprising functional groups which promote disaggregation of the particles in the presence of a liquid phase, and the target substance comprises a nucleic acid.

53. (Original) A process according to claim 52, wherein the sample comprises unfractionated nucleic acid.

54. (Previously Presented) A process according to claim 45, wherein the target substance is isolated from the sample.

55. (Previously Presented) A process according to claim 45, wherein the target substance is a contaminant which is depleted from the sample.